How is the IUGONET project using TDAS?

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- Themis Data Analysis Software tutorial -

How is the IUGONET project using TDAS?

(IUGONET : Inter-university Upper atmosphere Global Observation NETwork)

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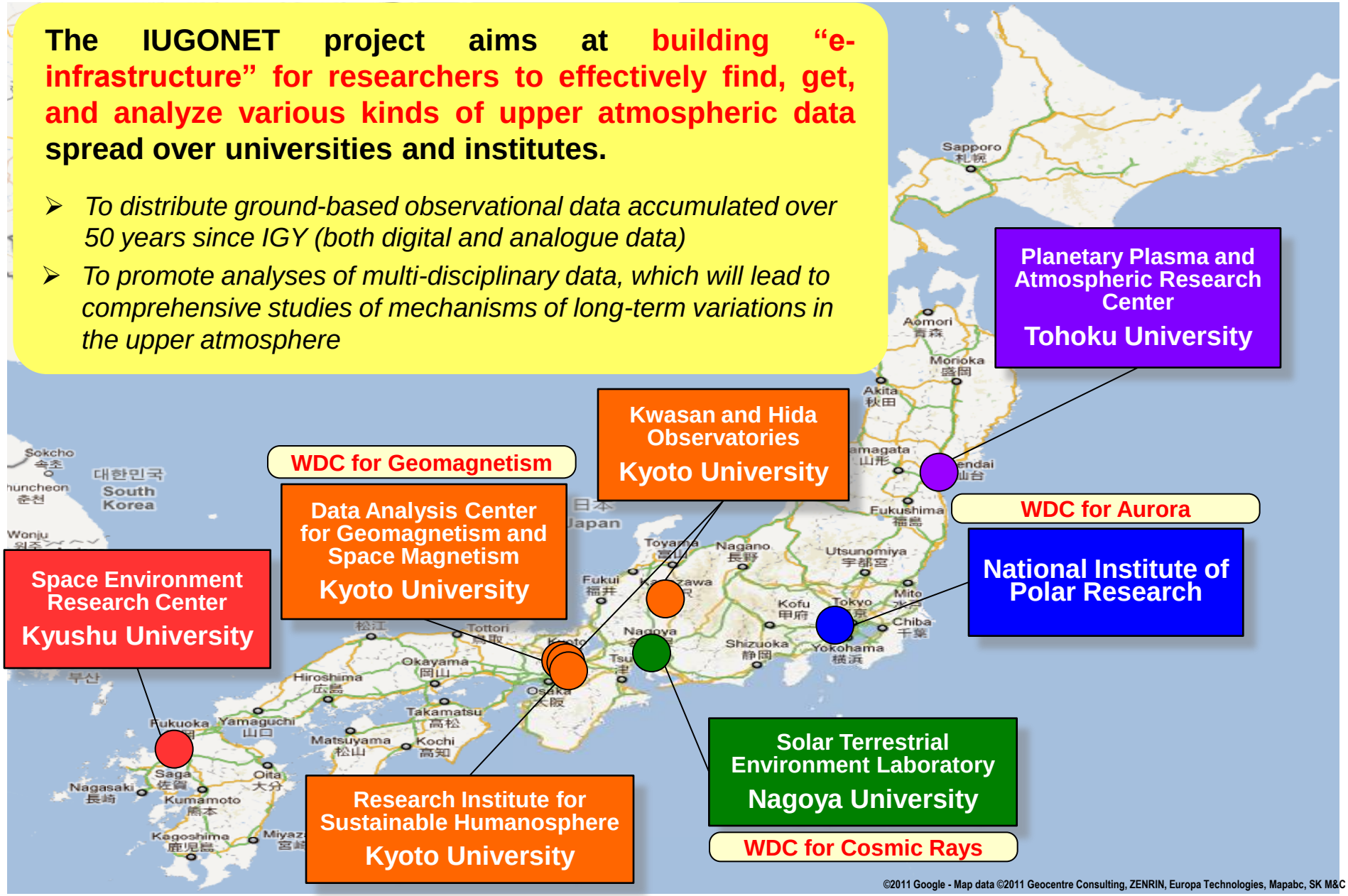
The IUGONET project - Objectives

The IUGONET project aims at building "e-infrastructure" for researchers to effectively find, get, and analyze various kinds of upper atmospheric data spread over universities and institutes.

- *To distribute ground-based observational data accumulated over 50 years since IGY (both digital and analogue data)*
- *To promote analyses of multi-disciplinary data, which will lead to comprehensive studies of mechanisms of long-term variations in the upper atmosphere*



京都大学 KYOTO UNIVERSITY

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Ground-based observations

● Optical Observation ▲ Radar Observation ◆ Magnetometer Observation

■ Tohoku Univ. ■ NIPR ■ Nagoya Univ. ■ Kyoto Univ. ■ Kyushu Univ.

Svalbard
IS radar (EISCAT)
meteor radar
aurora imager

Tromso
IS radar (EISCAT)
meteor radar
MF radar

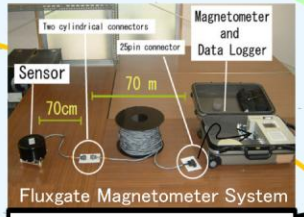
Iceland
aurora imager x2
magnetometer x3
ELF/VLF receiver
riometer

Iitate and Onagawa Observatories

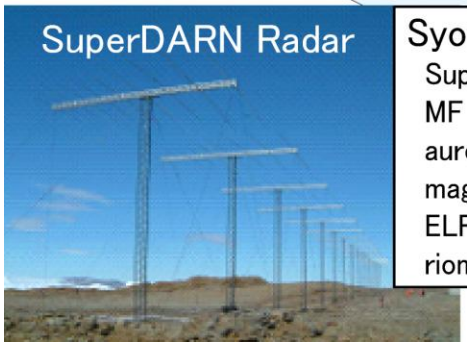
SuperDARN
Hokkaido HF radar

Hida Observatory
Solar Magnetic Activity
Research Telescope

Equatorial Atmosphere Observatory



MAGDAS Observation Point

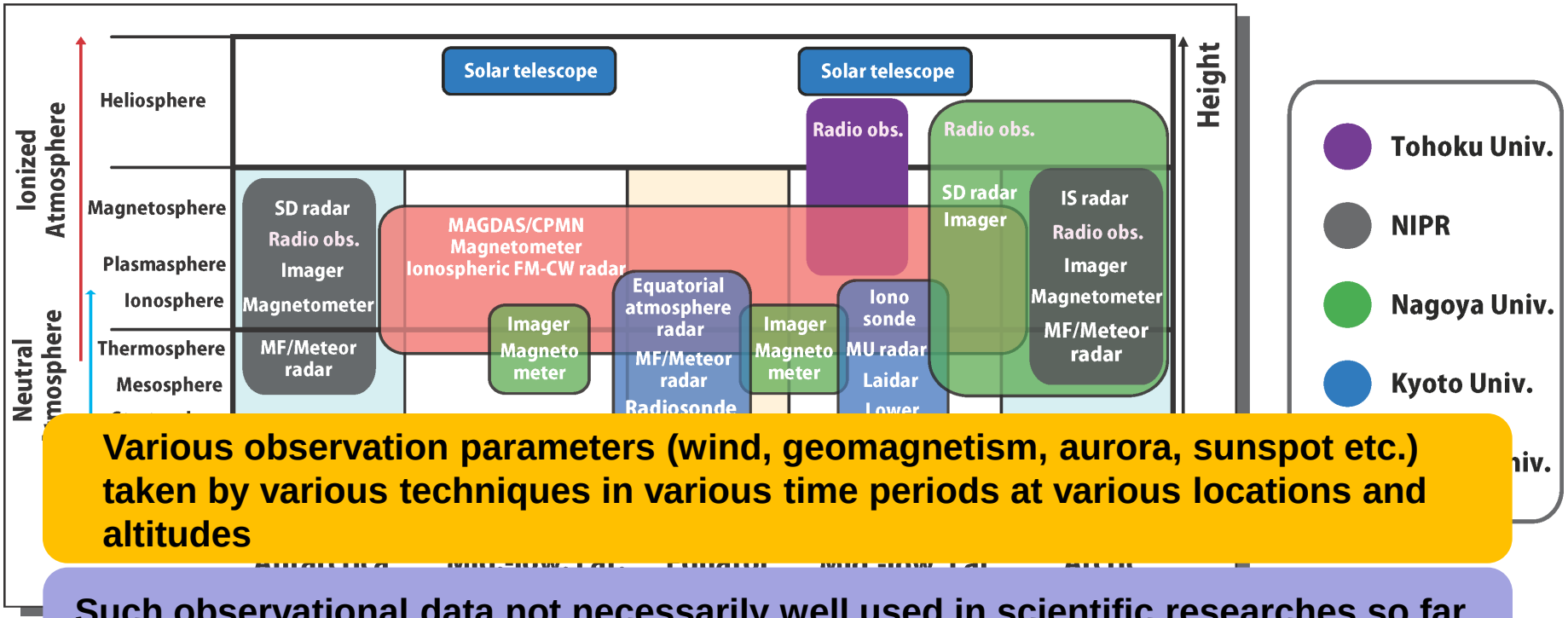


Syowa Station
SuperDARN radar x2
MF radar
aurora imagers
magnetometer
ELF/VLF receiver
riometer

Peru Ica University

▲ MST radar
MF/meteor radar
◆ MAGDAS magnetometer
▲ FM – CW radar
● OMTI imager
◆ WDC magnetometer
— Magnetic Equator
(IGRF2005, Height 100km)

Problems with data use



Various observation parameters (wind, geomagnetism, aurora, sunspot etc.) taken by various techniques in various time periods at various locations and altitudes

Such observational data not necessarily well used in scientific researches so far

➔ PROBLEMS: databases dispersed, too little info, various data format, etc.

SOLUTIONS

1. Metadata database : to share info of data online and realize cross-search
2. Data analysis software : to help users quickly visualize and analyze data

Main products by the IUGONET project

1. Metadata database

http://search.iugonet.org/iugonet

2. Data analysis software

http://www.iugonet.org/en/software.html

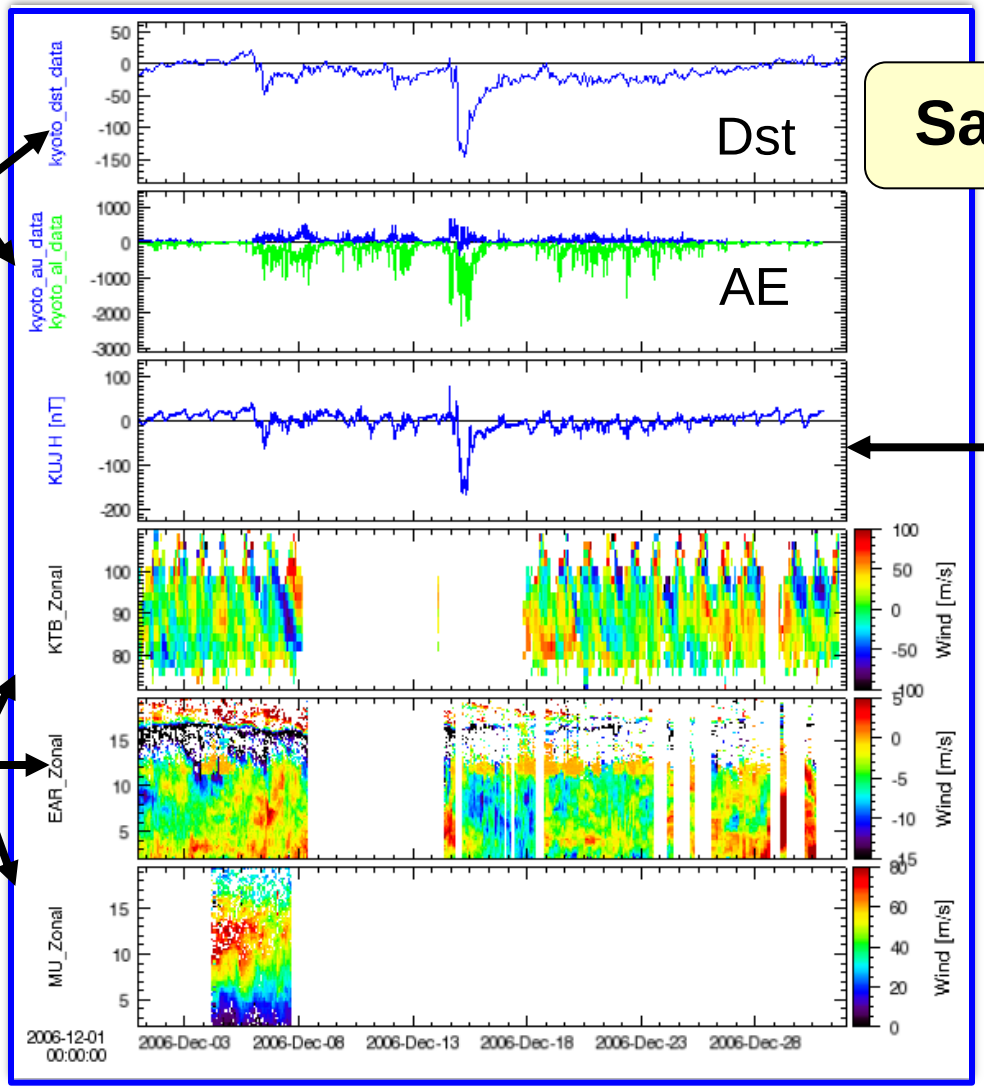
We have already released the IUGONET metadata database and the data analysis software for beta-testing!

IUGONET Data Analysis Software (UDAS)

UDAS is a plug-in software of TDAS and includes the load procedures for the ground-based observational data distributed by the IUGONET institutions.

Geomagnetic field indices

Various ionospheric and atmospheric radar



Sample plot

Global magnetometer network data

How to install UDAS

http://www.iugonet.org/en/software/install.html

0. If **TDAS** has not been installed yet, download TDAS and set it up.

1. Download **UDAS** from the IUGONET website.

2. Unzip the downloaded file.

3. Copy UDAS into any directory you want.

4. Set IDL path to access UDAS prior to TDAS.

Load procedures provided by IUGONET

Load procedures included in UDAS v1.00.b3

1. Load procesures for the IUGONET data:

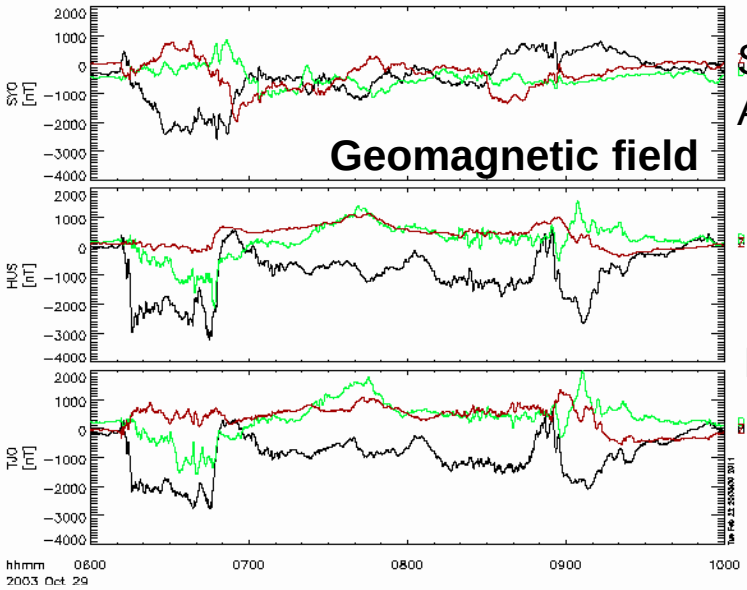
- iug_load_blr_rish_txt ; Boundary Layer Radar data（RISH, Kyoto）
- iug_load_ltr_rish_txt ; L-band Lowe Troposphere Radar data（RISH, Kyoto ）
- iug_load_ear ; Equatorial Atmosphere Radar data（RISH, Kyoto）
- iug_load_eiscat ; EISCAT radar data (NIPR; Nagoya)
- iug_load_gmag_serc ; MAGDAS geomagnetic data（Kyushu）
- iug_load_gmag_wdc ; AE, Dst, Sym, Asym induces, geomagnetic data（WDC, Kyoto）
- iug_load_iprt ; Iitate Planetary Radio Telescope data（Tohoku）
- iug_load_mu ; Middle and Upper (MU) atmosphere radar data（RISH, Kyoto）
- iug_load_meteor_rish ; Meteor wind radar data（RISH, Kyoto）
- iug_load_mf_rish ; MF radar data（RISH, Kyoto）
- iug_load_gmag_mm210 ; Alias of erg_load_gmag_mm210 (Nagoya)
- iug_load_gmag_nipr ; Alias of erg_load_gmag_nipr (NIPR)

2. Load procedures for the ERG-related data:

- erg_load_sdfit ; SuperDARN（Nagoya; NIPR; NICT）

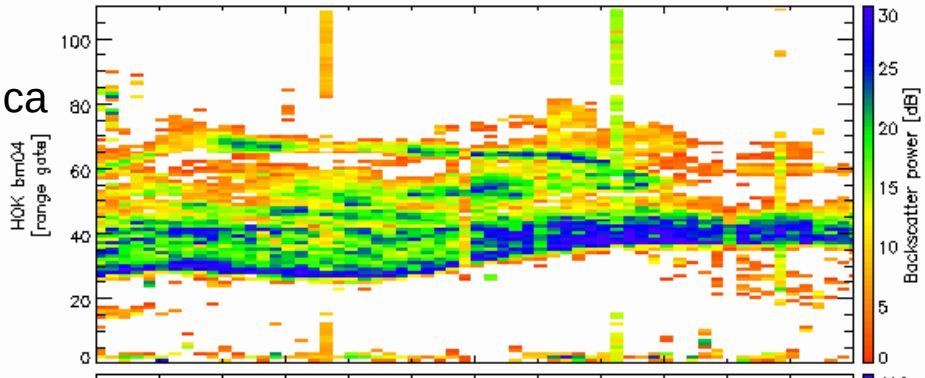
Our software has been developed in collaboration with **ERG Science Center**.

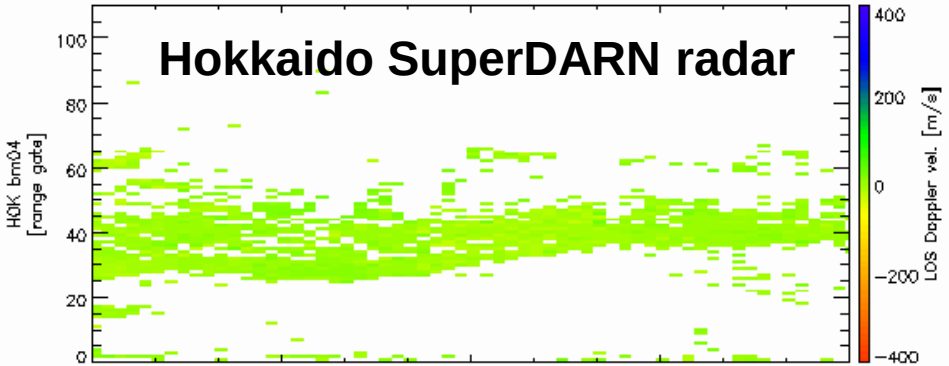
Sample plot of the IUGONET data

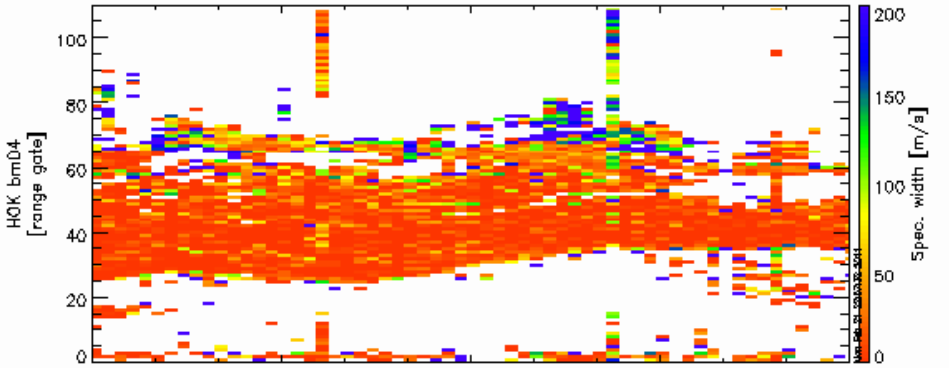


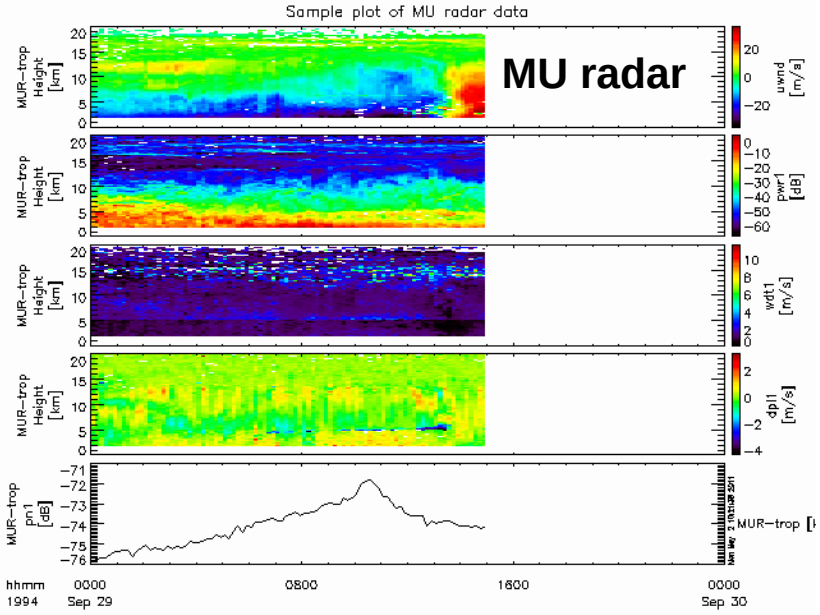
Syowa, Antarctica

Iceland



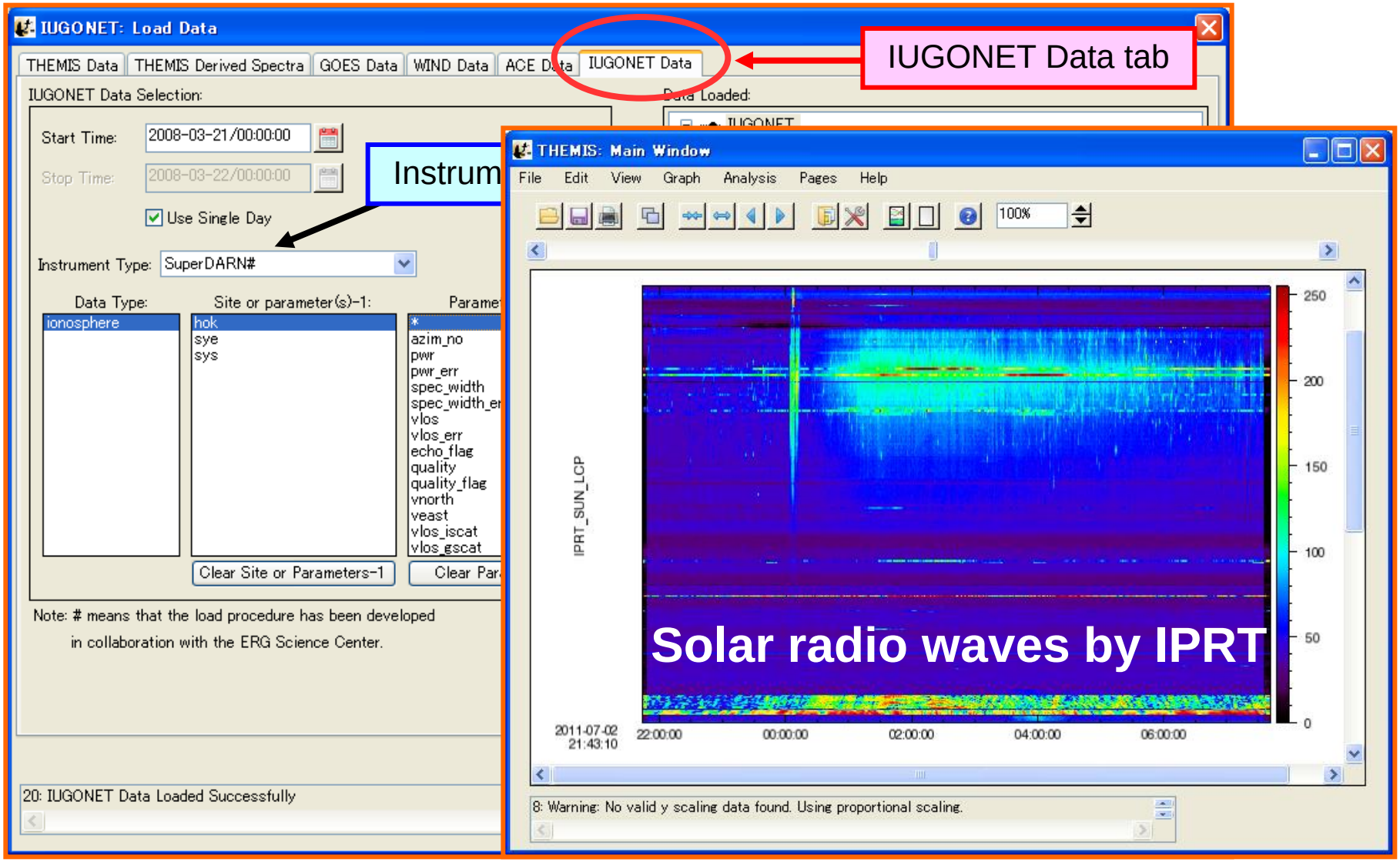






GUI for the IUGONET Data

You can use GUI for loading the IUGONET data.



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Summary

- **The IUGONET project (http://www.iugonet.org) builds metadata database and data analysis software (UDAS) to promote effective use of upper atmospheric data taken by various ground-based observations.**

- **UDAS is a plug-in software of TDAS and provides the load procedures for the various ground-based observational data distributed by each institution in the IUGONET project.**

- **The IUGONET products have been beta-released!**

Metadata database : http://search.iugonet.org/iugonet/

Analysis software : http://www.iugonet.org/en/software.html

We welcome your feedback